What is claimed is:

1. A heat-sensitive recording material which comprises at least (a) a support, (b) a heat-sensitive recording layer formed on at least one side of the support and containing an electron-donating compound and an electron-accepting compound and (c) a protective layer,

the protective layer being an outermost layer provided by being formed on a smooth-surfaced substrate and removing the smooth-surfaced substrate, and

the protective layer surface having a distinctness of image (according to JIS K 7105-1981) of at least 75% (slit width 2 mm).

2. The heat-sensitive recording material according to claim 1, wherein the recorded portion formed by carrying out recording from the protective layer side with an energy of 80 mJ/mm^2 by a thermal head shows a distinctness of image (according to JIS K 7105-1981) of at least 75% (slit width 2 mm).

3. The heat-sensitive recording material according to claim 1, wherein the recorded portion formed by carrying out recording from the protective layer side

with an energy of 80 mJ/mm^2 by a thermal head is 0.15 to 0.50 μm in root-mean-square average of roughness (according to JIS B0601-1982) as determined by an interference microscope (JIS B0652-1973).

4. The heat-sensitive recording material according to claim 1, wherein the recorded portion formed by carrying out recording from the protective layer side with an energy of 80 mJ/mm^2 by a thermal head exhibits a gloss (JIS P 8142-1993) of 30% or more at 20 degrees and 85% or more at 75 degrees.

5. The heat-sensitive recording material according to claim 1, wherein the smooth-surfaced substrate is 0.05 to 0.20 μm in the root-mean-square average of roughness (JIS B0601-1982) as determined by an interference microscope (JIS B0652-1973).

6. The heat-sensitive recording material according to claim 1 which comprises:

(a) the support (S),

(b) (b1) the heat-sensitive recording layer (TG) formed on at least one side of the support, or

(b2) the heat-sensitive recording layer (TG) formed on at least one side of the support and an

adhesive layer (EB) formed on the heat-sensitive recording layer, or

(b3) an adhesive layer formed (EB) on at least one side of the support and the heat-sensitive recording layer (TG) formed on the adhesive layer; and

(c) the protective layer (OC), and if desired,

(d) an intermediate layer (ML) formed between the heat-sensitive recording layer (TG) and the protective layer (OC) or between the heat-sensitive recording layer (TG) and the adhesive layer (EB),

the protective layer being an outermost layer provided by being formed on a smooth surface of a smooth-surfaced substrate and removing the substrate, and

the protective layer surface having a distinctness of image of at least 75% (according to JIS K 7105-1981, slit width 2 mm).

7. The heat-sensitive recording material according to claim 6 which comprises :

(a) the support (S),

(b) the heat-sensitive recording layer (TG) formed on one side of the support, the intermediate layer

(ML) formed on the heat-sensitive recording layer and the adhesive layer (EB) formed on the intermediate layer, and

(c) the protective layer (OC).

8. The heat-sensitive recording material according to claim 6, wherein the protective layer comprises a water-soluble or water-dispersible resin.

9. The heat-sensitive recording material according to claim 7, wherein the adhesive layer is provided by forming an uncured adhesive layer containing an electron beam-curable compound and curing the electron beam-curable compound by irradiation with electron beam.

10. The heat-sensitive recording material according to claim 9, wherein the electron beam-curable compound is a hydroxyl group-containing electron beam-curable compound.

11. The heat-sensitive recording material according to claim 10, wherein the hydroxyl group-containing electron beam-curable compound is 2-hydroxyethyl (meth)acrylate, 2-hydroxypropyl (meth)acrylate, 2-

hydroxy-3-phenoxypropyl acrylate or (meth)acrylic acid condensate of epichlorohydrin-alkanediol polymer.

12. A process for producing a heat-sensitive recording material which comprises:

(e) a support (S),

(f) (b1) a heat-sensitive recording layer (TG) formed on at least one side of the support, or

(b2) a heat-sensitive recording layer (TG) formed on at least one side of the support and an adhesive layer (EB) formed on the heat-sensitive recording layer, or

(b3) an adhesive layer (EB) formed on at least one side of the support and the heat-sensitive recording layer (TG) formed on the adhesive layer; and

(g) a protective layer (OC), and if desired,

(h) an intermediate layer (ML) formed between the heat-sensitive recording layer (TG) and the protective layer (OC) or between the heat-sensitive recording layer (TG) and the adhesive layer (EB),

the protective layer surface having a distinctness of image of at least 75% (according to JIS K 7105-1981, slit width 2 mm),

the process comprising forming the protective layer on a smooth-surfaced substrate with a smooth surface which is about 0.05 to about 0.20 μm in the root-mean-square average of roughness (according to JIS B0601-1982) as determined by an interference microscope (according to JIS B0652-1973), and removing the substrate.

13. The process according to claim 12, which comprises any one of the following processes:

(i) a process comprising combining

the protective layer (OC) formed on the smooth-surfaced substrate and comprising a water-soluble or water-dispersible resin with

a laminate comprising the support (S), the heat-sensitive recording layer (TG), the intermediate layer (ML) and an uncured adhesive layer (EB) comprising an electron beam-curable compound in this order,

in such a manner that the protective layer (OC) is brought into contact with the uncured adhesive layer (EB),

irradiating the combined product with electron beam to cure the electron beam-curable compound, and

removing the smooth-surfaced substrate,

(ii) a process comprising combining

the protective layer (OC) formed on the smooth-surfaced substrate and an uncured adhesive layer (EB) comprising an electron beam-curable compound and formed on the protective layer, or an uncured protective layer (OC(EB)) comprising an electron beam-curable compound and formed on a smooth-surfaced substrate, with

a laminate comprising the support (S), the heat-sensitive recording layer (TG) and the intermediate layer (ML) in this order,

in such a manner that the adhesive layer (EB) or the protective layer (OC(EB)) comprising an electron beam-curable compound is brought into contact with the intermediate layer (ML),

irradiating the combined product with electron beam to cure the electron beam-curable compound, and removing the smooth-surfaced substrate,

(iii) a process comprising combining

the protective layer (OC) comprising a water-soluble resin or water-dispersible resin and formed on the smooth-surfaced substrate and the heat-sensitive recording layer (TG) formed on the protective layer and the intermediate layer (ML) formed on the heat-sensitive recording layer with

a laminate comprising the support (S) and an uncured adhesive layer (EB) comprising an electron beam-curable compound in this order,

in such a manner that the intermediate layer (ML) is brought into contact with the uncured adhesive layer (EB),

irradiating the combined product with electron beam to cure the electron beam-curable compound, and removing the smooth-surfaced substrate,

(iv) a process comprising combining

the substrate (S)

with a laminate formed on the smooth-surfaced substrate and comprising the protective layer (OC) comprising a water-soluble or water-dispersible resin, the heat-sensitive recording layer (TG), the intermediate layer (ML) and an uncured adhesive layer (EB) comprising an electron beam-curable compound in this order,

in such a manner that the uncured adhesive layer (EB) is brought into contact with the support (S),

irradiating the combined product with electron beam to cure the electron beam-curable compound, and removing the smooth-surfaced substrate, and

(v) a process comprising combining

a laminate comprising an uncured protective layer

(OC(EB)) comprising an electron beam-curable compound, an intermediate layer (ML), a heat-sensitive recording layer (TG) and a support (S) in this order, with

a smooth-surfaced substrate,

in such a manner that the uncured protective layer (OC(EB)) is brought into contact with the smooth-surfaced substrate,

irradiating the combined product with electron beam to cure the electron beam-curable compound, and removing the smooth-surfaced substrate.

14. A process according to claim 13, wherein the adhesive layer contains a pigment having an average particle size of 0.2 to 3 µm.

15. A process according to claim 13, wherein the electron beam-curable compound is a hydroxyl group-containing electron beam-curable compound.

16. A process according to claim 13, wherein wherein the hydroxyl group-containing electron beam-curable compound is 2-hydroxyethyl (meth)acrylate, 2-hydroxypropyl (meth)acrylate, 2-hydroxy-3-phenoxypropyl acrylate or (meth)acrylic acid

condensate of epichlorohydrin-alkanediol polymer.